

## Hollow interconnecting panels as lost formwork

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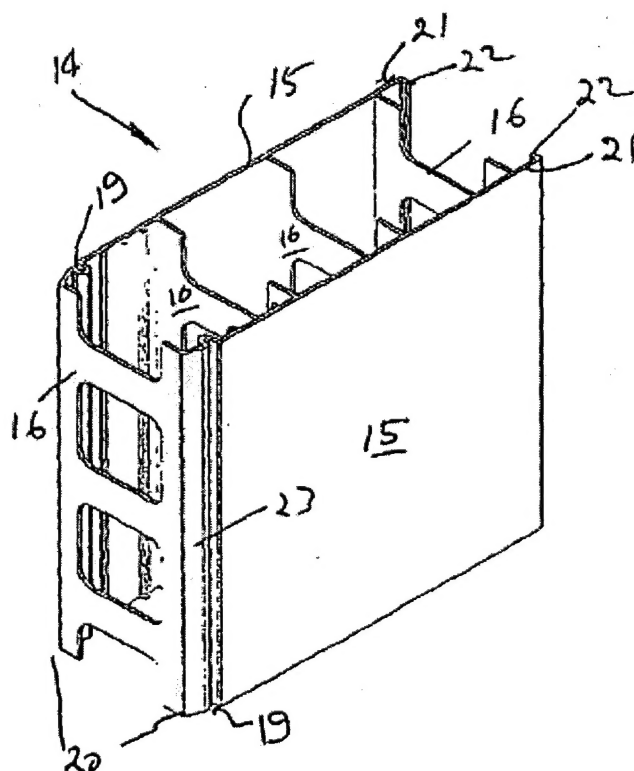
WO03031740 (A1)  
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### Abstract of NZ532182

An elongated building element (14) to form a series of walls (10) to (13). The elements (14) each have longitudinally extending flanges (21) that snap engage with longitudinally extending grooves (19) in the next adjacent element (14). Accordingly the wall (10) is constructed by joining the elements (14) in a direction transverse their general direction of extension. If so required the elements (14) may be filled with concrete.



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## A BUILDING ELEMENT

### Technical Field

The present invention relates to building elements and more particularly but not exclusively to building elements which are joined to form walls of a building.

### Background of the Invention

It is known to form walls from building elements which are vertically extended extruded hollow members. Adjacent members are connected by cooperating flanges and grooves with the elements joined by longitudinal sliding relative movement. The elements are hollow and are subsequently filled with concrete to provide them with strength and rigidity. Typically, the building elements are formed of extruded plastics material.

USA Patent 6212845 discloses a building element typically as described above. A wall is constructed by connecting adjacent elements by first connecting one element to a floor and then coupling subsequent elements thereto by vertically sliding relative motion. A similar construction is also disclosed in USA Patents 6189269, 5974751, 5953880, 5729944 and 5706620.

The above discussed elements have a disadvantage in that their sliding relative movement for coupling purposes hinders their assembly. Their lengths makes them difficult to handle when being placed in position to form a wall.

A further disadvantage is that each element has either two male or two female coupling portions. Thus there is the need to manufacture and stock a variety of different elements.

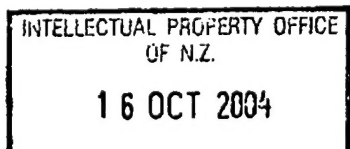
Less relevant structures are described in USA Patents 3440785, 3555751, 3815311, 3828502, 4104837, 5274975, 5293728, 5404686 and 6247280.

### Object of the Invention

It is the object of the present invention to overcome or substantially ameliorate the above disadvantage.

### Summary of the Invention

There is disclosed herein a hollow elongated building element including:  
a pair of longitudinally extending spaced side walls which are generally parallel and coextensive;  
transverse webs joining the side walls; and wherein



said element has at least one longitudinally extending groove and at least one longitudinally extending flange, with the flange and groove being positioned and configured to engage a respective groove or flange of a like element to secure the elements together by snap engagement of the flange within its respective groove by movement transverse of the element.

Preferably, the element has a pair of grooves and a pair of flanges, with each groove being formed in a respective one of the side walls, and each flange being an extension of a respective one of the side walls.

Preferably, the grooves extend transversely inwardly from their respective side walls.

Preferably, the element includes a transverse web extending between the side walls to aide in stiffening the side walls.

Preferably, said transverse web includes a central flange joined to the side walls by means of pairs of end flanges that diverge from the central flange to the side walls so as to provide a longitudinally extending recess.

Preferably, a method of forming a structure from a plurality of building elements according to the above, said method including the steps of securing adjacent elements by relative movement therebetween in a direction transverse of the elements so that the flanges snap engage within adjacent grooves.

### **Brief Description of the Drawings**

A preferred form of the present invention will now be described by way of example only with reference to the accompanying drawings wherein:

Figure 1 is a schematic perspective view of a building element;

Figure 2 is a schematic perspective view of a further building element to be used in conjunction with the building element of Figure 1;

Figure 3 is a schematic top plan view of a series of building walls formed with building elements such as the building elements of Figures 1 and 2;

Figure 4 is a schematic enlarged view of the portion 4 of the walls depicted in Figure 3;

Figure 5 is a schematic enlarged top plan view of the junction 5 of the walls of Figure 3; and

Figure 6 is a schematic enlarged top plan view of the corner 6 of the walls of Figure 3.

Figure 7 is a schematic perspective view of a modification of the building element of Figure 2; and

Figure 8 is a schematic end elevation of a coupling element employed with the building elements of Figures 1 to 7.

### **Detailed Description of the Preferred Embodiments**

In the accompanying drawings there is schematically depicted a series of walls 10 to 13 of a building. Each of the walls 10 to 13 is formed of a plurality of building elements 14. In this respect it should be appreciated that each of the building elements 14 is elongated, but can be of any required transverse width. For example, in Figure 1 there is schematically depicted a modified element 14 which is wider.

The element 14 has two generally parallel coextensive side walls 15 joined by transverse webs 16. Typically, the webs 16 would have apertures 17. The elements 14 are hollow and receive concrete 18. Accordingly, the elements 14 provide a permanent formwork to receive the concrete 18. Typically, high slump concrete is poured into the assembled elements 14. Preferably, the elements 14 would be formed of extruded plastics material such as polyvinyl chloride so as to provide a permanent waterproof finish.

Each of the side walls 15 is provided with a longitudinally extending groove 19 adjacent a longitudinal edge 20 of the respective side wall 15. Extending from each side wall 15 is a longitudinally extending flange 21, the flanges 21 being generally parallel and coextensive with respect to the grooves 19. Each flange 21 includes a longitudinally extending lip 22 which is received within the grooves 19 of the next adjacent element 14. Extending to each groove 19 is a ramp surface 23.

When assembling the elements 14 adjacent elements 14 are moved in a transverse direction relative to each other, with the flanges 21 being resiliently urged apart by means of the surfaces 23. When the lips 22 are aligned with the grooves 19 they snap engage within the grooves 19 to retain adjacent elements 14 together. Accordingly, the flanges 21 extend between adjacent elements 14.

Typically, the walls 10 to 13 would be provided with end caps, such as the end caps 24. At junctions such as those illustrated in Figures 5 and 6, adjacent elements 14 not secured together by flanges 21 and associated grooves 19 may be secured together by other means such as adhesives and/or fasteners if so required. It should further be appreciated that the elements 14 may include bends such as the element 25 shown in Figure 3.

When constructing the walls 10 to 13 an installer would secure guide channels to associated floor and ceiling surfaces by means of adhesives or fasteners. The elements 14 are then placed in the tracks and transversely moved into engagement. Thereafter, the elements 14 may be filled with the concrete 18.

5 In the case of site concrete filled elements 14, the walls 10 to 13 can be poured either with the slab above or prior to the slab formwork of the level above.

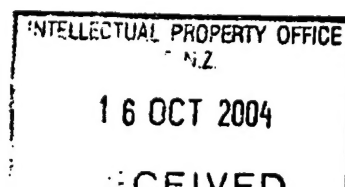
The walls 10 to 13 may be load bearing or non-load bearing as required. Still further, if so required, reinforcing elements may pass longitudinally through the elements 14.

10 In Figure 7 there is schematically depicted a modification of the building elements 14. In this embodiment a transverse web 25 is provided to aid in stiffening the longitudinal side walls 15. More particularly the transverse web 25 has a central flange 26 joined to the walls 15 by means of diverging end flanges 27. The end flanges 27 diverge from the flange 26 toward the walls 15. The transverse web 25 enables the  
15 flanges of walls 15 to be decreased in thickness relative to previous similar elements.

In Figure 7 the longitudinally extending recesses 28 can be used to duct service items such as electrical and communication cables.

In Figure 8 there is schematically depicted a coupling member 28. The coupling member 28 enables adjacent elements to be coupled in which the adjacent elements have  
20 adjacent grooves 19 as opposed to grooves 19 and flanges 21. The member 28 has a central elongated web 29 and flanges 30 to snap engage in the grooves 19.

As can be seen from the element 14 of Figure 7, the aperture 17 maybe of an alternative configuration such as circular.



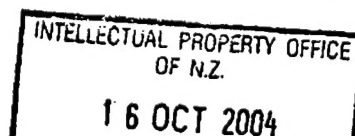
**The claims defining the invention are as follows:-**

1. A hollow elongated building element including:  
a pair of longitudinally extending spaced side walls which are generally parallel and coextensive;  
5 transverse webs joining the side walls; and wherein  
said element has at least one longitudinally extending groove and at least one longitudinally extending flange, with the flange and groove being positioned and configured to engage a respective groove or flange of a like element to secure the elements together by snap engagement of the flange within its respective groove by  
10 movement transverse of the element.
2. The element of Claim 1, has a pair of grooves and a pair of flanges, with each groove being formed in a respective one of the side walls, and each flange being an extension of a respective one of the side walls.
3. The element of Claim 1 or 2, wherein grooves extend transversely  
15 inwardly from their respective side walls.
4. The element of Claim 1, 2 or 3, further including a transverse web extending between the side walls to aid in stiffening the side walls.
5. The element of Claim 4, wherein said transverse web includes a central flange joined to the side walls by means of pairs of end flanges that diverge from the  
20 central flange to the side walls so as to provide a longitudinally extending recess.
6. A method of forming a structure from a plurality of building elements according to any one of Claims 1 to 4, said method including the steps of securing adjacent elements by relative movement therebetween in a direction transverse of the elements so that the flanges snap engage within adjacent grooves.
- 25 7. A hollow elongated building element substantially as hereinbefore described with reference to Figure 1, Figure 2 or Figure 3 of the accompanying drawings.
8. A wall having a plurality of building elements according to any one of Claims 1 to 5 and 7, wherein adjacent elements have engaged flanges and grooves.

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